

# *Canadian Journal of* **PUBLIC HEALTH**

VOLUME 41

TORONTO, SEPTEMBER 1950

NUMBER 9

## **Canadian Nutritional Problems, with reference to the Canadian Dietary Standards**

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**T**HIS paper, regardless of the wording of the title, is bound to be a consideration and comparison of the new Canadian Dietary Standard as published in Vol. 2, No. 1, 1950, of the Nutrition Bulletin of the Canadian Council on Nutrition and the one which it replaces—the Recommended Dietary Allowance prepared by the Food and Nutrition Board of the U.S. Research Council, published originally in 1943, and subsequently as revised editions in 1945 and again in 1948, as National Research Council Reprint and Circular Series Nos. 115, 122 and 129, respectively. Specifically, discussion will be confined to the seven nutrients included in the statement of Adult Maintenance Requirements.

At the outset it should be pointed out that these two sets of recommendations are of necessity based on the same evidence and data. Consequently they must be similar in many respects. Where they differ, they do so in a few instances because of a difference of opinion in the interpretation of the data, but primarily because of a difference in the philosophy underlying the nature and purposes of Feeding Standards. Thus many, if not most, of the differences in the figures given represent more apparent than real disagreement on basic nutritional needs.

No dietary standard can be taken as a final authority of nutritional requirements. Our knowledge is far from complete in this matter. As more facts are learned, standards are revised with a view to correcting weaknesses or extending their scope. One has only to review the Feeding Standards which have been used either for livestock or for the human, to appreciate the evolution which has taken place.

It was to make available a set of recommendations which would be more useful in Canada than those of the U.S. Food and Nutrition Board that the 1950 Canadian Standard was prepared. It was logical that an attempt would be made

*Contribution from the Faculty of Agriculture, McGill University, Macdonald College, Que., Canada. Journal Series No. 269.*

to overcome any weaknesses which were inherent in other standards in the light of the specific purposes for which the tables were wanted. In this respect there were two basic characteristics of the Food and Nutrition Board Allowances which were especially considered. The first was the failure to make the maximum use of the fact that size of individual is the characteristic most directly affecting the need for all of the nutrients related to energy and protein. This shortcoming has been common to all human feeding standards. All livestock standards, on the

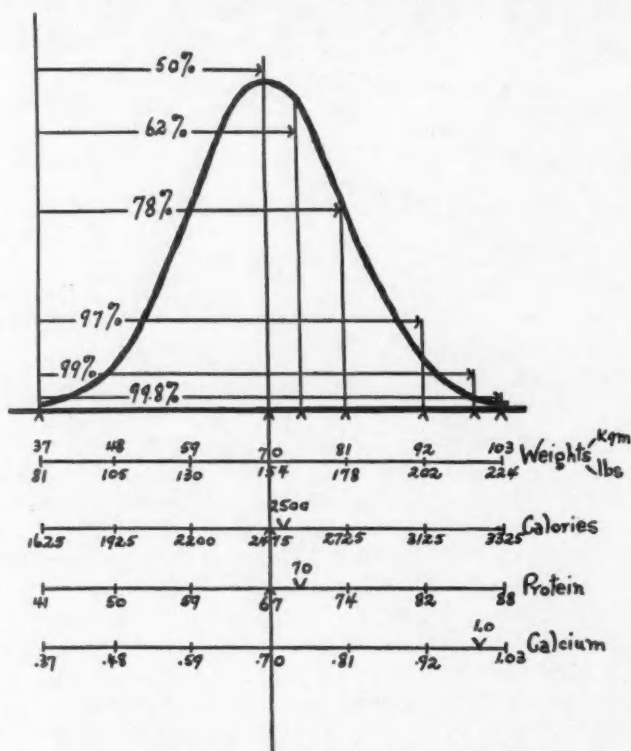


FIG. 1.—Dietary needs for calories, protein, and calcium in relation to weights of adult males.

other hand, are based primarily on size and this is the secret of their usefulness as guides in the rationing of individual animals.

The second problem was a matter of philosophy regarding the purposes of a dietary standard. Experience has shown that, regardless of name or description, tables of dietary recommendations are taken as yardsticks in assessing the results of diet surveys. It is difficult to interpret a diet survey which deals with nutrients without some "Standard" with which to compare or evaluate the findings regarding food intake. To be of greatest use in this respect it is desirable, if indeed not practically imperative, that the allowance values, either as stated or through calculation, be applicable to individuals; and further that they indicate as accurately

as possible the quantities actually needed to permit continued health. It is admitted that there is difficulty in defining health in the nutritional sense. This is one of the limitations of all feeding standards. It is no solution, however, to arbitrarily add to the best possible estimate of requirement a "health allowance". Instead it changes the nature of the "Standard" and bars it from use in assessing individual dietaries.

The Recommended Dietary Allowances of the U.S. Food and Nutrition Board include margins above the estimated actual requirements. In discussing the features of their tables the authors state: "Because the allowances take into consideration the requirements of those in the upper level of the normal range of requirements they allow a factor of safety for persons who have an average or less than average requirement. In most categories this factor of safety for the average person is estimated to be approximately 30 per cent. . . . Inasmuch as some persons who receive less than the recommended allowance of one or another nutrient may remain in health through long periods, it becomes apparent that these allowances are not to be used as the sole criteria for judging the state of nutrition of any population." The Board is even more specific on this point in the statement, "The allowances are intended to serve as a guide for planning an adequate diet for every normal person of the population and not for the average member of the group categories."

Nutritionists will not quarrel over the satisfaction of a higher than necessary plane of nutrition for most of the nutrients considered in feeding standards. There are many arguments, however, in favour of a standard which is a "nutritional floor" below which intakes should not be allowed to fall. If desired one could as easily recommend that where possible the standard values be raised by 30 per cent as to set the standard at 130 per cent of the need. Actually the margins of safety in the U.S. tables vary from 0 to 100 per cent, depending on the nutrient. Not only are they variable but they are obviously of necessity much more matters of opinion than are the estimates of true requirements. There are no quantitative experimental data bearing on the question of how much more than enough is better.

There is another fact that appears to have been overlooked. Any standard which is based on the needs of an average man will be too much for all below average and too little for those that exceed the average, if by average we refer to size.

It is indeed possible that much of the confusion and uncertainty in the interpretation of dietary standards giving literal requirements versus those showing recommended allowances which are frankly higher than average needs, arises from failure to state requirements in terms of size of the individual. The situation may be illustrated by depicting the male population in terms of a "normal curve" of their body weights. The area under the curve is divided to show the proportion of the population included between the lower limit and various points above the average, taking as limits of the population three times the standard deviation, or the range of weights from 80 lbs. to 228 lbs. (Fig. I).

On the scales below are shown certain nutrients. The figures under the scale lines are the estimated actual requirements, and those above are the recom-

mended allowances (including the margins) placed corresponding to the weights for which they would represent actual requirements. Thus the size of the margin over the actual need is shown in relation to the differing sizes of men.

As an example we may take the case of calcium, where the allowance is stated to be "enough for all but one man in 100". This turns out to be the normal requirement for a man weighing 99 kgm. or 218 lbs. In terms of margin for the individual man of the population this daily allowance of 1 gram of calcium provides the following excesses:

EFFECT OF SIZE OF THE INDIVIDUAL ON "MARGIN" IN A NUTRIENT  
RECOMMENDED AT A FIXED LEVEL FOR ALL ADULTS

Wt. of Man		Probable Ca requirement gm.	"Margin"	
kgm.	lb.		gm.	%
36	80	.40	.60	150
55	120	.55	.45	82
70	154	.70	.30	43
85	185	.80	.20	36
100	220	1.00	0	0

Thus the recommendation of 1 gram calcium as the desired intake for the average man shows a margin of some 40 per cent over the probable needs. If the same intake is taken for a particular individual, it may represent a margin all the way from 0 to 150 per cent, depending on how big the man happens to be.

The case of protein may be cited in contrast. Here the previous recommended allowance was coupled with size—"one gram per kgm. of body weight". This allowance is claimed to provide "a reasonable margin of safety". The effect of considering weight in this way is shown below:

EFFECT OF SIZE OF AN INDIVIDUAL ON "MARGIN" IN A NUTRIENT  
RECOMMENDED PER UNIT WEIGHT INSTEAD OF PER UNIT  
BIOLOGICAL SIZE

Wt. of Man		Probable Protein requirement gm.	Recommended 1 gm./kgm. wt.	Margin	
kgm.	lb.			gm.	%
36	80	41	36	-5	-12
55	120	55	55	0	0
70	154	67	70	3	5
85	185	77	85	8	10
100	220	87	100	13	15

Here it is evident that, though not excessive, the margin or discrepancy is not constant at different weights. This is because the adjustments for size of individual are made directly in proportion to weight, whereas there is evidence that in the case of protein the relationship involves rather the 3/4 power of weight. When a direct weight-requirement is used, the smaller individuals are



short-changed while the larger individuals get increasingly greater margins over needs.

One more case may be taken to illustrate the features of present standards which it was hoped to improve in the new Canadian Standard. The caloric need is admittedly governed jointly by body size, which largely determines the maintenance portion of the requirement, and by the degree of muscular activity. Men of differing sizes require about equal calories for equal work. (The caloric cost of moving the larger man is neglected for the present.) That adjustment of calories for size is desirable is recognized in the Food and Nutrition Board Allowances. They state that the quantities should be decreased or increased proportionately for smaller or larger persons. How much is not clearly stated. They say, "due account should be taken of the concept of ideal weight," and again, "——caloric allowances be regarded as subject to modifications of  $\pm 15$  to 20 per cent according to conditions."

Calculations in the following table are interesting in this regard, based on the figure of 3000 calories for a physically active 70 kg. man, and 4500 calories for one at heavy work.

EFFECT OF ADJUSTMENTS OF TOTAL CALORIE NEEDS FOR BODY WEIGHT AS COMPARED TO ADJUSTMENT OF MAINTENANCE PORTION ONLY PER UNIT BIOLOGICAL SIZE

Weight		Recommended Allowances of Calories					
kgm.	lb.	Adjusted in proportion to weight		Adjusted on basis of $\pm 20\%$ for range of wts. of individuals		Maintenance portion only adjusted to W. <sup>75</sup> (Canadian Plan)	
		Active	Heavy work	Active	Heavy work	Active	Heavy work
36	80	1550	2325	2400	3600	2125	3625
55	120	2350	3575	2825	4100	2625	3875
70	154	3000	4500	3000	4500	3000	4500
85	185	3650	5500	3300	4950	3350	5300
100	220	4300	6500	3600	5400	3700	5200

In the last column the Canadian Plan of basing the adjustment in calories only on the maintenance portion of the totals, and of adding a fixed quantity for the activity, is in agreement with the accepted relation of body size to the total caloric need of an adult. Obviously no adjustment at a fixed rate applied to the total caloric intake can accurately compensate for size differences; and the discrepancy will increase as the proportion of the total for the purpose of meeting the activity decreases, and as the individuals involved are progressively smaller than average.

In the development of the 1950 Canadian Standard these characteristics of the previously used tables were carefully considered in the light of desirable changes which might make the standard more accurate as a guide for the feeding of individuals or in assessing their accustomed dietaries. It was felt that a statement of actual requirements compatible with nutritional health, as far as they could be deduced from present information, was a more generally useful basis than was one recommending more liberal quantities. It avoids the diffi-

culties in setting margins on any defensible grounds, while at the same time it in no way discourages or obstructs the use, where desired or economically possible, of a more liberal dietary.

To introduce the concept of size on a workable basis necessitated separating the adult requirement into two parts: that for maintenance, using differences in metabolic size (i.e.  $W^{.75}$ ) as the major cause of differing dietary needs; and a supplementary schedule of recommendations for activity including the states of pregnancy and lactation.

In the case of juveniles it was merely necessary to equate age to weight in accordance with accepted age-weight standards.

A comparison of the quantities of the several nutrients called for in the new Canadian Standard for an average person leading a sedentary life as compared to those in the table of allowances which it replaces, may be of some interest. Also shown are the former values minus the "margin of safety" where the margin was originally stated.

COMPARISON OF NEW WITH PREVIOUS CANADIAN RECOMMENDATIONS FOR SEVEN NUTRIENTS WHOSE REQUIREMENTS ARE DEPENDENT ON BODY WEIGHT OR A FUNCTION THEREOF

Nutrient	Canadian Standard 1950 (Sedentary Activity)				Previous Canadian Standard (U.S. Food and Nutrition Board 1945) for 154-lb. adult male	
	100 lb.	126-lb. average female	154-lb. average male	200 lb.	As stated	Minus Margin
Calories	1825	2125	2476	2925	2500	2500
Protein (gm.)	.50	.56	.67	.80	.70	—
Calcium (gm.)	.45	.55	.70	.90	.80	.70
Thiamine (mg.)	.55	.65	.75	.85	1.20	.67
Riboflavin (mg.)	.90	1.00	1.20	1.40	1.60	1.10
Niacin (mg.)	5.50	6.50	7.50	8.50	12.0	6.7
Vit. A (i.u.)	3200	4000	5000	6600	5000	—

It will be noted that for the average man weighing 70 kg., or 154 lbs., there has been little change in recommendation for those nutrients known to be variable in requirement according to body weight, if the previous allowances are restated on the basis of actual need. The modifications in the new Standard, then, are largely confined to the provision for adjustment for size; and to the view that a statement of actual requirements, in so far as they are known, offers a more useful guide in nutrition than do more liberal recommendations.

One thing further remains to be said. It concerns the allowances for activity. Keys<sup>1</sup> has called attention to the unsatisfactory nature of our knowledge and estimates of the caloric requirements for muscular activity. First is the obvious discrepancy between the requirement for the actual work while it is in progress, as in nailing or sawing or in pushing a lawn mower, and the intensity of work for the total day. Can the results of measurements of active movement

<sup>1</sup>Keys, Ancel: Nutrition Abs. & Rev., V. 19, No. 1, pp. 1-10, 1949.

legitimately be multiplied by some number of hours to calculate a day's activity, when it is known that the active part of some types of work is variably intermittent. Thus there is the strong suspicion that present estimates of calories needed by workers of certain classifications are seriously inaccurate and tend to be high. On the other hand, trades which call for more continuous effort, even at a lower maximum intensity, may be underestimated in our present tables.

A further consideration is the effect of body size on the energy cost of work. In occupations requiring body movement, there is an energy expenditure greater for the heavy man than for the smaller individual. This is not now taken into account.

Obviously there is much to be learned in this field alone before tables of nutrient requirements can be expected to fit satisfactorily the case of Mr. Jones.

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#### CORRECTION

The JOURNAL regrets that in the article by Miss Sheila Toshach, "Bacteriophages for *C. Diphtheriae*", published in the August issue, the sets of photographs on page 334 were transposed.

# The Progress of the National Health Grants

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THE National Health Program, or, as it is frequently termed, the health grants plan, was announced in the House of Commons a little more than two years ago. Under the program, grants-in-aid totalling more than \$30,000,000 a year were to be made available to the provinces for the development and extension of health services.

In the two years of operation of the scheme considerable progress has been made toward erecting a solid and enduring health structure according to the sketch plans provided by the government and the blueprints drawn up in consultation with the Dominion Council of Health and other provincial advisory bodies. As might be anticipated, some parts of this structure have been developed much more rapidly than others. However, the work is by no means finished, and what I shall tell you should be regarded simply as an interim report on a project which is still very definitely in the builders' hands and must depend upon them for its final form and functional efficiency.

When the National Health Program was being drawn up, the question of hospital accommodation occupied a great deal of the attention of those responsible. At that time, according to the best information that could be obtained, there was a shortage of approximately 40,000 hospital beds of all kinds in Canada, with an anticipated increase in this deficit, over the next ten years, of an additional 20,000 beds. It was felt that a reasonable target for the first five years of the program would be the existing shortage—the 40,000 beds. Then, in 1953, it was intended that we would take another long look at the hospital situation and decide what revisions in policy might be required at that time. It might be mentioned that some of the less optimistic felt no substantial changes would be required because we would be nowhere near the target.

To provide sufficient impetus to get things moving, grants exceeding \$13 million a year were set aside for hospital building, with the federal government matching provincial grants up to a ceiling of \$1,000 per bed for active treatment hospitals and \$1,500 per bed for institutions treating the chronically ill or convalescent patients. From the inception of the plan to the present time, federal-provincial grants have been allotted to aid in the provision of more than

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*Presented before the Public Health Administration Section at the thirty-eighth annual meeting of the Canadian Public Health Association, held in the King Edward Hotel, Toronto, June 12-14, 1950, in conjunction with the first meeting of the Ontario Public Health Association.*

19,800 beds. And if the present tempo of construction keeps up, there is no question that the target of 40,000 beds will be reached well within the five-year period.

Among the grants which are designated for specific purposes, the funds made available for new mental health services are the largest—\$5,156,000 in the current fiscal year. Substantial amounts of this grant have been used in every province for improving treatment services in mental hospitals. Thousands of dollars' worth of new medical, surgical and technical apparatus have been bought to enable the staffs of these hospitals to institute diagnostic and curative measures for which they had the knowledge but, heretofore, not the tools. Much more extensive use of both occupational and recreational therapy is one of the more interesting features under this grant.

On the preventive side, every encouragement has been given to the development of mental health clinics, especially for children and adolescents. More than 30 of these have already been set up in different provinces. Others are being planned, but the crucial problem is to find adequately trained personnel to staff them. To help break this bottleneck, substantial grants have been made to several universities to enable them to increase their training facilities for psychiatrists, psychologists, psychiatric nurses and psychiatric social workers. This is the only sure solution to the problem, although it is admittedly one which requires more than a modicum of patience.

Another significant development has been the establishment of a training course in mental health for experienced teachers from our primary and secondary schools. This course is sponsored by the University of Toronto and the Canadian Mental Health Association and utilizes the schools of Forest Hill Village. It is designed to give teachers experience in the management of children's behavior and personality problems, and to qualify them as instructors in mental hygiene for other teachers and as liaison officers between the school system and the local mental health clinic. In this way it is hoped to give teachers a wider knowledge for the preventive mental health work which is often best accomplished during school hours. The mental health grant is being used to pay the salaries of the instructors and to provide bursaries for some of the teachers attending the course.

Another of the larger grants is for cancer control—this year more than \$3,500,000. In those provinces which already had a highly developed cancer control program, the national grant is being used to strengthen and extend services already being carried out by some provincial agency. In other provinces where such services are not so well developed, federal funds are being used to meet part of the cost of new cancer detection clinics, biopsy and kindred services. Almost all provinces are supporting fundamental research through grants to the National Cancer Institute of Canada.

It might be added that funds for cancer control are provided on a matching basis; that is, the federal government will assume up to one-half the cost of approved cancer diagnostic and treatment services in any particular province. Under most of the other grants, the moneys are provided outright and do not require any matching expenditure from provincial funds.

Three annual grants of half a million dollars each are set aside for profes-

sional training, for work among crippled children, and for venereal disease control.

The urgent need for more and better-trained public health personnel is a subject which needs no detailed exposition. The value of the professional training grant is emphasized by the fact that it was the first to be fully allotted, and requests for bursaries have continued to be so heavy that substantial commitments for specific types of training have been charged against other grants not being as fully utilized. More than 1,300 persons have already received direct financial aid through this grant for formal courses of training, and a large number of others have received additional instruction through short courses and refresher work financed by the other health grants. The list of specialties being studied runs the gamut of public health interests. The largest group is that of the nurses—399 in all—of whom 215 are engaged in taking courses in public health; the second largest involves mental health personnel, who number 233. These figures change from week to week as new applications are received through the provincial health departments and will be substantially larger within a few weeks as the flow of applications for courses commencing in September begins to arrive.

In the control of venereal diseases, emphasis has been placed upon the extension of case-finding measures and the improvement of treatment procedures in existing programs. A number of projects aimed at the development of epidemiological activities have been devised and in the treatment field financial support is being provided for the increasing proportion of patients visiting the private physician. This is being accomplished through the provision of free penicillin to the physician for both syphilis and gonorrhoea, and by payment of fees to the practitioner for certain cases. This is, of course, in addition to the usual subsidy provided to the public health clinic. Laboratory procedures in venereal disease control are also receiving tangible support.

Funds under the V.D. control grant are now provided on a matching basis similar to the cancer grant so that expenditures are shared equally by the Dominion and the province concerned up to the full amount of each province's allotment.

Development of a program of assistance to crippled children has proved somewhat more difficult to implement than had been expected. But substantial progress has been made in the establishment and expansion of registries of crippled children; the establishment of travelling clinics, particularly for less populous areas where hospital and medical facilities are not easily accessible, and for the development of clinics for the treatment of cerebral palsy and other crippling conditions. In the administration of this grant every care has been taken not to interfere with the excellent work being done by service clubs, lodges, churches and other private organizations, but to co-operate with them and to supplement their programs wherever possible.

Last year expenditures from this grant were only a little more than \$187,000. I suggest that the members of this Association should give careful thought to the work which might be accomplished in their own communities, with the help of money available through this grant, and that they should present their suggestions



to their provincial health departments for integration into the over-all provincial pattern of action being developed.

In the field of tuberculosis control much more gratifying progress has been made. In the utilization of this grant, now amounting to \$4,226,000, particular stress has been placed upon the extension of services aimed at the discovery and treatment of tuberculosis. Detection services have centered chiefly round the routine hospital admission chest x-ray procedure and the expansion of mass survey activities through the use of mobile units and specific survey projects.

In the field of institutional care and treatment of tuberculosis, the purchase and free provision of streptomycin and para-amino salicylic acid received emphasis in all provinces.

Massive quantities of equipment for active treatment, both medical and surgical, general sanatorium care and post-sanatorium management of tuberculous patients, have been provided. Other projects involve the addition of administrative and technical staff at provincial tuberculosis control offices or their official agencies, in the chest clinics and in sanatoria, the improvement and extension of laboratory services, the use of B.C.G. vaccine, and the development of rehabilitation and educational activities, both lay and professional.

When the national health program began, \$100,000 a year was allotted to encourage public health research. This increases by the same amount each year and now stands at \$300,000. In other words, in a little more than two years the federal government has advanced to the position of a substantial contributor to public health research in Canada. This amount, of course, does not include the substantial sums available through the National Research Council for purely medical research.

Unlike the other grants, that for public health research is not allotted on a geographical or population basis but solely on the merits of individual projects put forward by scientific workers in universities and other research centres across the country, through their respective provincial health authorities. Each of these submissions is reviewed by a special committee of the Dominion Council of Health. At the moment 57 research projects are being financed by this grant, including an allotment of over \$75,000 for the production and study of ACTH and cortisone in Canada.

To stimulate further research in the public health field, funds are earmarked from the other health grants. For example, with the co-operation of all the provinces, over \$160,000 from the General Public Health Grant has been set aside for the purchase of ACTH and cortisone for special clinical research.

Apart from hospital construction, the largest of all the grants at the present time is that intended for the extension of general public health services, amounting to more than \$6 million this year. This is a sort of catch-all for an endless variety of projects which do not fit into any of the other specific compartments, but which are none the less an integral part of the total program.

The grant is being used extensively for new health services in schools, especially for preventive dentistry, vision testing, audiometric services and immunization programs, i.e., for the purchase of equipment and the salaries of personnel



to handle the extra work. Under this grant at least two provinces have expanded their industrial health services, and almost every province has extended its public health laboratory facilities. In Toronto it is financing a glaucoma clinic which may well be the pilot plant for a development of inestimable value to persons threatened with loss of sight from this particular condition.

As previously mentioned, all provinces have used a small percentage of the grant for the purchase of ACTH and cortisone, and all have made grants to the Canadian Arthritis and Rheumatism Society to assist in organizing and developing a program of research and public information. This grant is also being utilized for the extension of health education. Newfoundland has set up a new division of health education within its provincial organization, and other provinces are employing more health educators, augmenting their film libraries and purchasing additional visual aid equipment.

But perhaps the most significant of all the many activities being financed by the General Public Health Grant are the new health units which have been established and the existing units which have been enlarged and strengthened. Here, the need varies from province to province, depending upon the stage of development and organizational pattern of the over-all health program. In several provinces the federal grant is being used to finance entirely new units in areas where formerly none existed. In others, action has been taken to provide additional equipment and extended services which it was not possible previously to finance. And all across the country this grant is being used to meet the salaries of additional public health personnel. More than 2,000 persons are now receiving compensation through federal health grants—many of them doctors, nurses, dentists, sanitary engineers and inspectors, veterinarians and clerical workers on the staffs of health units.

While to many of you who are directors of health units or are intimately concerned in their administration, it may be of general interest to learn of these various measures under the National Health Program, your more immediate concern would quite understandably be, what does this mean in terms of improvement of services and facilities at your own unit?

I would point out that the chief purpose of the General Public Health Grant is the further extension and strengthening of general public health services, both provincially and locally. This latter brings the matter right back to you and gives you a very real and direct interest in this grant. This is, of course, in addition to the somewhat more indirect but none the less profitable participation you may have in the several other health grants.

In your consideration of the utilization of these grants, a point which is of fundamental importance is that the funds are made available *to the provinces*. Thus, in order to obtain financial support under any of the grants, all dealings must be made with your own provincial health department. There is no direct channel to the federal source of supply.

The procedure by which financial aid is obtained is through the submission and approval of projects dealing with specific health services, and it is in the preparation of such projects that I feel some amplification of these comments might be of interest and value to you. The process of developing and maintaining

a project is something with which you are all familiar, but I would emphasize that there are two major principles which should be borne in mind: the first, the establishment of the need for the particular service or facility; and the second, the demonstration of the benefit being derived after the project has been brought into effect.

To establish the need, a careful survey and study of the problem in your health unit should be carried out. I would suggest that this be not limited to the specific project itself, but that it be viewed in its relationship to the total health picture in your unit. In short, the unit director should make a really worth-while evaluation of his existing services and as a direct result he will determine not only the various requirements for improving these services but also the order of their importance.

These requirements will logically fall into two groups:

1. Equipment, the purchase of which will be a short-term or non-continuing project.
2. Services, which will come under the category of long-term or continuing projects.

In the matter of equipment, greater stress should be placed upon the first major principle, the demonstration of need, since, by fulfilling an actual and existing need for such equipment, the benefit which follows should be evident.

As to long-term projects, careful attention should be given to all aspects—the need, the means by which this need will be met, and the assessment of results when these means have been implemented. Therefore, all related factors must be taken into consideration at the time of planning the project and careful consideration given to the accumulation of all pertinent details.

From your survey will result the information essential to the development of the project itself. In its preparation I would place particular emphasis upon two specific features of the designated health grant forms. The first is the explanation of the purpose of the proposal. This should convey a clear picture of the contemplated project and should present a strong case in its support. With this should be included a well-thought-out prediction of the expected benefits to be achieved, assuming that the project is brought into operation.

The second point to which special attention should be given is the preparation of the budget. A particular effort should be made to assure that this is as close to the actual figure as possible. Each of the six main headings into which the budget is divided, together with its detailed breakdown, should be carefully considered and the answers arrived at on the basis of previous experience, an actual cost estimate, or some similar dependable method.

Specific details as to the classification of various items under the six indicated headings are as follows:

1. *Personal Services*

(a) *General*

Salaries, wages, fees for professional and special services, allowances, cost-of-living bonus; other pay-list items

(b) *Professional Training*

Salaries, stipends, subsistence or other allowances for trainees and instructors

2. *Travel*
  - (a) *General*  
Travelling expenses including operating expenses of motor vehicles
  - (b) *Professional Training*  
Travelling expenses of trainees and instructors
3. *Equipment*
  - (a) *General*  
Purchase of medical, chemical, laboratory, occupational therapy, x-ray and office equipment; medical and scientific books and journals; surgical instruments; purchase of motor vehicles; audio-visual equipment; depreciation allowances on motor vehicles
  - (b) *Professional Training*  
Purchase of equipment for professional training
4. *Material and Supplies*
  - (a) *General*  
Purchase of medical, chemical, laboratory and office supplies and materials; purchase, care and feeding of small animals; drugs, x-ray plates and films; photographic supplies; hospital and laboratory clothing; miscellaneous supplies and materials; health education pamphlets
  - (b) *Professional Training*  
Books and miscellaneous supplies for trainees and instructors
5. *Rent, Utility Services*
  - (a) *General*  
Rent of office and other premises and rental of equipment *except when owned by the Province or Dominion*; light, heat, power and water; communications services
  - (b) *Professional Training*  
Expenditure of similar nature for professional training
6. *Other*
  - (a) *General*  
Grants to societies and institutions; freight, express and cartage; laundry and dry cleaning; technical services such as fees for x-rays, tests and treatments by institutions; incidental costs not provided for elsewhere
  - (b) *Professional Training*  
Tuition fees for trainees; incidentals  
Generally speaking, items that are more or less expendable should be classified under material and supplies and those of a more permanent nature under equipment.

While touching upon the financial aspects, I should mention the necessity for keeping accurate account of expenditures on projects. Since public funds are being utilized it will be essential, at the conclusion of the project or at the termination of the fiscal year, that an examination of expenditures be made. Therefore, a suitable form of book-keeping should be set up in connection with the expenditure of moneys received under any project. If several are being carried on in your unit, they should be maintained separately in order to avoid any confusion. Accurate records of all expenditures will facilitate the audit of accounts and, in the long run, will save the health unit director both time and effort.

I am sure most directors will find it advisable to work out the details of a proposed project in consultation with the representative of the provincial health department most concerned. With the basic information supplied by yourself, the requirements of the several forms can be met much more readily with the advice and guidance of someone more familiar, perhaps, with the forms and procedures.

I can assure you that a little extra time, thought and consideration devoted to the preparation of the project, with respect particularly to adequate explanatory remarks and the accurate determination of estimates, will expedite its passage through the regular channels and increase its chance of early favorable consideration.

You will recall that, earlier, I outlined two major principles in the development and maintenance of projects. The first was the establishment of need. Now,

briefly, the second—the demonstration of benefit being derived. This relates to the actual functioning of the project, and it is of particular importance that a yearly appraisal of continuing projects be conducted. This will show whether the anticipated results are being obtained, and if the project should be reduced or expanded in terms of personnel, facilities, expenditures, etc. This will depend upon whether or not the maximum of service under the project has been achieved and can only be determined through careful and accurate evaluation of the results.

To sum up—in this discussion of the federal health grants I have attempted to outline the pattern which the National Health Program has followed in the first two years of its operation. I have also tried to set forth, in some detail, the procedure by which assistance under the grants may be obtained for the improvement of public health in individual areas.

In the practical application of public health procedures the major task is, as always, at the level of the local health officer. It is for his assistance that the grants are primarily intended. It is our sincere hope that by augmenting already existing health services and facilities, and further fortifying the efforts of all those active in this field the health grants are proving a useful and effective stimulus and will continue to fulfil this function in the unremitting drive toward the highest levels of public health in Canada.

## Health Problems of the New Organic Insecticides

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OWING to the high degree of specialization which today typifies the health field, there is an inevitable trend toward self-sufficiency on the part of each specialty, and sometimes we lose sight of the fact that public health is essentially a matter of team-work among the special divisions of the subject. I can think of no better case for team-work in public health than the health problem presented by the new pesticides. These powerful economic aids, though representing the height of scientific ingenuity in man's long fight against insect pests, involve a threat to the health of the chemical worker in the manufacturing plant, to the intermediate handlers, to the farmer and orchard man in the field and, in many instances, to the ultimate consumer of the marketed produce. The enjoyment of the benefits which these materials have to bestow depends upon the extent to which we are able to protect ourselves against their associated dangers. In this effort the combined resources of Federal, Provincial and local public health groups is fundamental. Cooperation between the special health sections concerned is clearly necessary; mutual understanding between industry, labour, agriculture and the health group is all-important.

Prior to the last war, the interest of public health officials in pesticides lay toward the control of pest-borne disease. The compounds employed presented little threat to the health of the sanitation specialist making the application and, with the exception of remote accident possibilities, these compounds presented no potential hazard to the local community. Pre-war agricultural practice also involved pest control for the purpose of protection of crops, but as the substances being employed were largely inorganic chemicals of low human toxicity, no associated threat to the health of farmer and horticulturist was implied except in the case of the notorious compound nicotine, which was in use long before public health organization was adequate to deal with the problem.

During the Great War circumstances combined to set the stage for the development of new and more powerful insecticides. A number of inorganic insecticides came into short supply on the civilian market owing to diversion of raw materials to war production. The supply of pyrethrum imported from British East Africa was interrupted by shipping difficulties. Derris shipments were

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*Presented before the Sanitation Section at the thirty-eighth annual meeting of the Canadian Public Health Association, held in the King Edward Hotel, Toronto, June 12-14, 1950, in conjunction with the first meeting of the Ontario Public Health Association.*

eventually cut off by the fall of Singapore. Meanwhile, an accelerated agricultural effort and armed forces requirements greatly increased the demand for pest control chemicals. Under such circumstances, research was undertaken to develop organic substitutes.

The first organic substitute introduced was DDT, which had been synthesized by Ziegler in 1874 and described as an insecticide by Müller in 1936 in connection with moth-proofing experiments. This compound proved to possess insecticidal power against such insects as mosquitoes and the common house fly and was found to be superior in potency to pyrethrin. Early production was assigned for military purposes. During the latter years of the war as production rose, DDT found a place of importance in agriculture to such an extent that 45 million pounds were employed in the United States in 1946. The success attained with DDT led to the development of other chlorinated hydrocarbon insecticides which proved to possess insecticidal properties in greater or lesser degree. Prominent among these was benzene hexachloride, reported by Slade in England in 1945. This discovery represented the culmination of the British search for a derris substitute which had been commenced in 1941.

Following the war allied technical intelligence representatives described in Germany the existence of another group of powerful insecticides—the organic phosphates. These materials had been developed by Schrader in 1942. The three most prominent were hexaethyl tetraphosphate, tetraethyl pyrophosphate and parathion (O-O-diethyl-O-p-nitrophenyl-thiophosphate). These compounds came on the American market in small quantities in 1948. Millions of tons are currently being employed in the control of mites and aphids, against which they have proved specially suitable.

The development of chlorinated hydrocarbon and organic phosphate analogs has been joined by the discovery of insecticidal properties for other chemical groups such as the organic sulphur compounds. A multitude of chemical entities have appeared on the market possessing fungicidal power. Time would not permit a detailed listing of the rodenticides, ovicides, vehicles, synergists and soil fumigants which have been brought to bear on our problems of pest control in the last few years.

A wide variety of insecticides is currently in use in North America. Among the chlorinated hydrocarbons, DDT and benzene hexachloride have been joined by toxaphene, methoxychlor, chlordane and heptachlor, each possessing a range of entomological applications. Gamma benzene hexachloride was identified as the most active isomer in Slade's original crude product and this isomer was offered in pure form during the 1949 season. In addition there is a new product, Aldrin, which was employed for the control of cotton boll weevil last year and will be employed in Canada this season for grasshopper control.

Large-scale production of the three organic phosphates, parathion, tetraethylpyrophosphate and hexaethyltetraphosphate, was reached in 1949 and is expected to be greatly increased during the current year. Meanwhile tolerance hearings at the U.S. Department of Agriculture in Washington this winter presage the introduction of ethyl para nitrophenyl thionobenzene phosphonate, octamethyl pyro phosphoramidate, tetraethyl dithionon pyrophosphate, and tetra-



ethyl isopropyl pyrophosphate, which are not as yet beyond the field testing stage.

Of general interest among the compounds listed are the pyrethrins, which were synthesized in 1949 for the first time by the United States Department of Agriculture laboratories. Evidence points to the possibility that synthetic pyrethrins will replace DDT and certain other chlorinated hydrocarbons once trade quantities are available. The thiocyno esters, synthetic contact poisons for horticultural and household use, have been found to possess low mammalian toxicity but their entomological future has not been finally assessed.

#### *Human Toxicity of Organic Insecticides*

The toxicology of the new organic insecticides was appraised by Lehman (1) in 1948. Cross-comparison between compounds was made in respect of the acute oral, chronic oral, and dermal aspects. In 1949 Lehman (11) reappraised the field. The literature of inhalation toxicology continues to be sparse even though the respiratory route is of major vulnerability for industrial and field workers applying insecticidal sprays and dusts.

Notable among the few organic insecticides of the pre-war period is nicotine. This dangerous compound, which has caused a large number of deaths, is generally considered to possess toxicity second only to the organic phosphates. Fortunately, the amount of nicotine employed in the field today is considerably reduced owing to replacement of this agent by the newer materials.

Early in its history DDT attracted the attention of industrial hygienists and came under suspicion of possessing human toxicity. It is a chlorinated hydrocarbon-dichloro-diphenyl-trichlorethane and hence chemically related to the simple chlorinated hydrocarbons, such as carbon tetrachloride and trichloroethylene which have been well known in the industrial hygiene field for many years. Studies of mammalian toxicology conducted during the war, notably by Lillie and Smith (2) and Neal and co-workers (3, 4), indicated that typical chlorinated hydrocarbon liver damage occurred on chronic exposure. Evidence on human toxicity of DDT began to appear in the medical literature shortly after the war. Wright, Doan and Haynie (5) report on agranulocytosis occurring after exposure to DDT pyrethrum aerosol bomb. Leider (6), Niedelman (7) and others describe contact dermatitis due to DDT. Various clinical records of human poisoning describe symptoms such as nervous tension, involuntary muscular tremors, convulsions, respiratory failure and, in gross exposures, death.

Recently metabolic studies by Telford and Guthrie (8) and Woodward, Ofner and Montgomery (9) have indicated that DDT and its analogs may be stored in considerable quantities in animal fat and be excreted via the mammary route. In this connection Kunze and co-workers (10) found evidence of liver injury in rats consuming a diet containing as little as 5 p.p.m. of DDT for four to six months. The employment of DDT in dairy barns directly on cattle has had to be discontinued and its use as a spray in barns has been restricted, for the material possesses residuality and lingers for extended periods of time.

Recent laboratory findings on the DDT successors such as chlordane, toxaphene and methoxychlor indicate that these compounds possess typical chlorin-



ated hydrocarbon toxicity. Lehman (11) rates aldrin, chlordane and toxaphene higher in toxicity than DDT and considers that the benzene hexachlorides and methoxychlor present a lower danger to man.

British Intelligence reports by Schrader (12) on findings in Germany revealed that the organic phosphates possess powerful anti-esterase activity. Du-Bois and Mangun (13) found that HETP inhibited cholinesterase of *P-Americana*. Working with the same insect, Chadwick and Hill (14) confirmed these findings on cholinesterase of nerve cord. Koppányi and co-workers (15) found similar cholinesterase suppression with various mammalian tissues. Chronic feeding experiments with rats showed no symptoms of parathion poisoning below 25 p.p.m. in the diet at the 52nd week (11). The mammalian toxicity has not been fully delineated but all evidence points to the organic phosphates as rapid-acting poisons possessing strong parasymphathomimetic activity.

The laboratory findings on organic phosphate toxicity were confirmed early in the 1949 crop season when three deaths and one near-fatality occurred in the formulation and packaging of parathion. Subsequently three field deaths in the United States were reported. Analysis of the field circumstances was made by the American Cyanamid Company, a primary producer of parathion, and the following information obtained.

*Case No. 1:* A farmer of Clayton, North Carolina, using a mule-drawn cart sprayer, applied parathion at the rate of 4 pounds of 25 per cent wettable powder per 100 gallons of water. That concentration is four or five times the recommended dosage. The operator walked behind the sprayer, one nozzle of which was so arranged that it was level with his face and only about 14 inches away. He used no respirator or other protection and inhaled spray mist all day long. His clothing became soaked with spray. This man was apparently not informed of the risks of heavy personal exposure.

*Case No. 2:* An entomologist of Riverside, California, applied parathion to citrus with a speed sprayer at the rate of 10 pounds of 25 per cent wettable powder to 500 gallons of water. The parathion which he was using was experimental material packed in 50-pound drums. The speed sprayer was loaded 17 times during the day. When this operation was observed on two occasions, the wettable powder billowed up into his face each time. This man wore no respirator or other protection and apparently inhaled considerable quantities of the 25 per cent wettable powder all day long. His clothing and leather gloves were also contaminated with parathion. This skilled user had an excessive and prolonged exposure.

*Case No. 3:* A sprayer of Lake Placid, Florida, was engaged in loading speed sprayers with 6 pounds of 25 per cent parathion wettable powder and 50 pounds of wettable sulfur to 500 gallons of water. This man had previously become sick and had been warned to be more careful. He stirred the sulfur and parathion with his bare hands to help force the material through the screen. No respirator protection was used. This man had gross skin contact and inhalation exposure to the wettable powder.

It was found that in none of these cases had protective measures been taken to avoid inhalation of spray and dust or to prevent skin contamination. Six cases

of serious illness were also reported late in the season but recovery was made after treatment with atropine and, in certain cases, administration of oxygen or artificial respiration. Study of all case histories emphasizes the rapid action of the organic phosphates and the critical importance of medical attention at the first onset of subjective symptoms.

### *Exposures and Control Measures*

The organic insecticides in the course of a few short years have come to present a challenging new problem to those charged with the protection of public health. The horizon has been widened from the employment of pesticides in communicable disease control to the vaster problem of protecting the health of the great community of industrial and agricultural workers exposed to the materials in the course of their daily work. The dermal, ocular and respiratory routes of entry to the body must be guarded. This is primarily a task for industrial hygiene, which has developed, over the years, specialized medical and environmental techniques capable of permitting safe manipulation of the multitude of poisonous materials which have preceded the organic pesticides. By co-operative action among the health agencies, the less well-defined threat to community health through the ingestion of these materials residual upon marketed produce can be controlled. Sanitation personnel play a key position in this imposing task.

The first human exposure to an insecticide occurs in manufacturing synthesis. Protection of industrial workers under the type of organized conditions which generally prevail in industry today presents a manageable problem through the employment of such techniques as closed processes, exhaust ventilation, personal respiratory protective devices and cleanliness regimens; these measures being supplemented by routine medical supervision.

It is customary to market organic insecticides in the form of emulsions, wettable powders, impregnated dusts or aerosol bombs. Formulation of these preparations involves extensive manipulation of concentrated materials. At this stage, as well as in packaging and bottling, rigid precautions are necessary if the health of the employee is to be protected. This work is not generally carried out by the manufacturer but is taken on by smaller concerns which specialize in formulation. Under these circumstances, the health problem looms, for it has been found in the case of other industrial hazards that the smaller the organization, the more difficult becomes the problem of proper industrial health control owing to the capital outlay necessary for ventilation and dust collection equipment as well as the operating expense of providing close medical supervision of exposed employees.

The application of the new insecticides by the individual farmer and horticulturist constitutes the major health problem in permitting unrestricted use of these important economic materials. The size of the operation is at a minimum. There is an unfamiliarity with the handling of dangerous materials. Capital investment is low and financial outlay for health protection must compete with narrowly budgeted operations expenditures. Currently, commercial distribution facilities for safety equipment are geared to the concentrated industrial market

and such equipment is not easily obtainable in rural areas. These factors combine to present a discouraging prospect for the employment of safe practices when highly toxic insecticides are applied. Quite apart from the intrinsic toxicity of the particular insecticide being used, there is a trend toward more hazardous methods of application. Aerosol-type spraying is increasing and this practice makes for fine particles which remain air-borne longer and penetrate the respiratory tract more deeply. The necessity to work around trees and plants following spraying creates a serious potential exposure to residual insecticide. Additionally there is evidence that concentrations of insecticide in spray mixtures and dusts may be increased to offset immunity which certain common pests have been noted to be developing against such insecticides as parathion and DDT. The sole circumstance mitigating against hazard is the intermittent character of the field applications, but this affords no protection against the rapid-acting poisons.

The American Cyanamid Company has prepared a series of slides showing methods of handling parathion safely under field conditions. These slides illustrate general principles of hygiene applicable to other compounds, and represent one aspect of the educational program which this parathion producer has carried out during the past two years with a view to helping the customer employ the product without ill effect. One cannot fail to recognize the intelligent and responsible attitude of the industry as a whole in connection with the health problems presented by the new materials. With few exceptions, the insecticide producers today adopt the point of view that sale of a potentially poisonous compound on the open market carries with it a measure of responsibility for customer safety that goes beyond the mere listing of precautions on labels. It is our experience that the ethical manufacturers now recognize the fundamental importance of carrying out careful studies of mammalian toxicology as a normal aspect of new product development. Common sense dictates that new chemicals should be screened for human toxicity before they are placed on the open market. Thereafter, rational educational programs for customer safety can be based upon scientific knowledge of toxicity, physical properties of the preparation and technique of application.

Among authorities in the field, a considerable body of opinion favours the suppression of insecticides toxic to warm-blooded animals beyond certain limits. In other quarters it is considered that compounds dangerous to man should be employed only by licensed pest control operators or by large field operations where organized conditions of work permit the application of industrial hygiene procedures. As regards insecticidal residues on food products, certain specialists consider that application of insecticides should be controlled so as to prevent the use of dangerous materials under such circumstances. All these considerations imply complex controls, restriction and regulation in contra-distinction to the traditional freedom with which agriculture and horticulture have long been pursued.

At the present time the sale of pest control products in Canada is relatively unrestricted. The Pest Control Products Act, a Federal Statute, requires as a condition of licence that poisonous products be so labelled. In addition, such

products must be capable of being employed safely with reasonable precautions. To satisfy this requirement, extensive field experience under controlled experimental auspices including medical supervision is obviously necessary in order to assess hazardousness and routine of precautions prior to licensing under the Act.

The health problems associated with organic insecticides have been under continuous study in the Department of National Health for many months past. A close working relationship has been established between the Division of Entomology of the Federal Department of Agriculture and the Industrial Health Division of the Department of National Health and Welfare with a view to ensuring prompt health consideration of promising insecticides. The Industrial Health Division acts in a technical advisory capacity to the Plant Products Division of the Agriculture Department which administers the Pest Control Products Act. In this fashion the administrators of the Act are able to obtain an estimate of the potential health hazard of products which may be candidates for licence under the Act. The Food and Drug Division joins in the work when occasion arises to consider materials likely to be employed in food and drug situations. Additionally, the Industrial Health Division prepares and distributes evaluations on toxicity of new compounds and co-operates with Provincial Health Departments in their efforts to make possible safe handling of insecticidal aids at factory, farm and orchard level. Whether this approach to the problem will prove adequate in the future will depend largely upon current safety experience, for there is little evidence to point to the forthcoming presentation of ideal materials having high insecticidal potency and negligible toxicity to man.

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## Trends in Community Health Services

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TO the layman and to other physicians it must, at times, be a source of wonderment that a physician should choose a career in public health in preference to some other specialty in medicine.

Certainly it is not because of the financial return. Salaries of physicians in public health have increased considerably in the past few years, but the monetary reward is still lower than in any other recognized specialty in medicine. The most a health officer can hope for is a living wage, never affluence.

It is not because the job is easier. True, the hours of work may be different, but a zealous public health physician will work at least as hard as any of his medical brethren.

It is not because he needs less training or less knowledge than he would require for another specialty. Indeed, to be a good health officer, he must be an internist, a paediatrician, a business administrator, a sanitarian, a diplomat, and a politician; the latter in its complimentary rather than its derogatory sense.

Then, if a health officer is to be relatively poorly paid, work very hard, and have to obtain a great fund of knowledge, why does he choose this career? There are many reasons, some tangible and some very hard to put into words.

He must have a spirit of service, a missionary outlook, a call to this career. He must be convinced that by entering this specialty he will do his community, his province, and his nation a real service. All physicians must have this philosophy or they are misfits in medicine. The man entering the field of preventive medicine must have it in double measure. He must be convinced that his role in public health is the most important job he can do.

The prospect of more or less regular hours, a salary cheque rather than the collection of bills, the anticipation of more or less regular vacations, some measure of job security, these are all factors that will influence his choice. His clients are not obtained on a competitive basis; rather, his medical services are to aid and supplement the family physician.

These are all good reasons for choosing public health as a career. To me, there is one further factor which is the most attractive and exciting part of this specialty. That is its infinite variety. In public health one need never fear boredom. As quickly as one problem is solved, two new ones arise. Matters which were not even considered to be public health problems a few years ago are now among our major concerns. This constant change requires a man with a flexible mind, one who will adapt himself to changing conditions, who will weigh the

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*An address to the Division of Health, The Welfare Council of Toronto, May 18, 1950.*

merits of a new situation, and, if its control will benefit the people as a whole, will be prepared to pursue its investigation to its ultimate control. To me, this variety, this constant change, is the most fascinating part of public health.

If we could bring back an Ontario health officer who had served his people 60 to 70 years ago, he would be hard put to recognize that we present-day workers in public health are engaged in the same field to which he gave his efforts. Many of his major problems have completely disappeared, many others are now under watchful control, others that never presented themselves to him are now taking up much of our time. In his day, diphtheria raged unchecked, typhoid and cholera were major problems, the means for control of smallpox was available but epidemics still occurred. To these and similar problems he gave the major part of his time. He could only wonder why so many babies died, he had no time to worry about the state of mental health of the community, care for the aged was a family responsibility, he might deplore crowded and inadequate housing but he did not consider it any of his affair. What a contrast to the picture in Ontario today! The serious epidemic diseases are now either completely or almost completely under control. A case of diphtheria is rightly headline news, Ontario has the lowest death rate from tuberculosis in the world, years have been added to the average life span, and infant deaths have been strikingly reduced. But these accomplishments, rather than reducing our responsibilities, have merely shifted our efforts into newer and often more difficult fields.

Lest we think we have beaten all our older problems, I would bring to your attention some extracts from a report published in 1850. This report has been rated by Dr. C.-E. A. Winslow as "one of the most remarkable documents—perhaps the most significant single document—in the history of public health". This is the Report of the Sanitary Commission of Massachusetts, 1850. It was prepared for the state legislature by Lemuel Shattuck, a bookseller and publisher of Boston. It is a remarkable document and many of his recommendations are as applicable today as they were a century ago. One is amazed at the vision of this man and his grasp of the fundamental problems affecting the health of the nation. I would like to cite just a few of his recommendations: (1) The creation of state and local boards of health, (2) adequate vital statistics, (3) general sanitary improvement and proper food control, (4) vaccination against smallpox and maritime quarantine, (5) intensive study of the problem of tuberculosis, (6) the promotion of health in infancy and childhood so that "a good foundation may be laid for vigorous manhood and old age", (7) protection of school children by proper environmental sanitation, by health education, and by study of sickness incidence, (8) care of the mentally ill to be a function of the Boards of Health rather than the courts, (9) measures to prevent or mitigate the evils arising from the use of intoxicating drinks and from haunts of dissipation, (10) town planning and control of over-crowded tenement and cellar dwellings, the erection of tenements "for the better accommodation of the poor", (11) establishment of training schools for nurses, (12) mobilization of public support for the public health program, the forerunner of the Health Council of today, all clergymen to devote at least one discussion yearly to the subject, (13) the program to be carried into the individual home.



It is difficult to realize that this report was written a century ago. Many of its recommendations have been carried out, but many are still our problems today. There is another very significant fact to remember about this report. Too often people feel that public health is the responsibility of the medical profession alone. Here is probably the most important document in public health, and it was written by a layman. It was fitting that the American Public Health Association, at its annual meeting in Boston in November 1948, should pay tribute to Lemuel Shattuck who pioneered the cause of sanitary reform. One hundred years ago foundations were laid on which there has been erected a modern structure of public health. But our building is far from complete, we can live in it but the winds still blow through empty window frames, the plumbing is not too reliable, and often the elevator stalls between floors. It is our mission, yours and mine, to see that this building be finished as soon as possible, that it become a home rather than just a mass of concrete, steel, and glass.

What, then, are the problems facing us in public health today? When I speak of our problems I am being insular, I am thinking of our problems in Ontario, and even more particularly, the problems I have myself encountered; but, by and large, these local problems are the problems of the nation. It is difficult to define the exact limits of the field of public health. There are many definitions. Two, I think, are most applicable. The first is that of Sir Wilson Jameson, who said that "Public health is the health of the public". The second is from the constitution of the World Health Organization. In its preamble it is stated: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." Using these two definitions, let us consider our problems in public health today and plan what may be done.

One of our new and most vital problems is that of an aging population. By gigantic efforts in the past the life span has been increased, the deaths in younger age groups have been prevented, and many more people are living to maturity and on into old age. From this has come a new specialty in medicine, geriatrics or the care of the aged. In 1850, the average duration of life in Ontario was 40 years. Today it is nearly 63 years for men and 65 for women. In 1881, less than 4 per cent of the population of Ontario were 65 years of age or older. By 1961, it is estimated that this group will have increased to nearly 11 per cent of the total population. This shift in the age grouping of our population has brought us a whole new series of problems. We are all mortal, we must all die. To a great extent we have eliminated the infectious diseases. Thus, we will now die either of diseases within ourselves or by accident. Before we consider the causes of death, let us think of some of the other implications of this older age group in our communities.

Many of the problems of the aged are not primarily problems of preventing death but rather helping these people to enjoy life. The solutions are not medical but sociological. They are bound up with our problems of housing, cost of living, and the importance of the family group to proper mental health. Years ago grandparents were welcome additions to our homes, they were happy, well-adjusted, valuable members of the household. Today, with our increasing trend to urban dwelling, our smaller houses, and the increased cost of living, often there is no



place for the old folks to go. Few have saved enough to be financially independent. In most communities the only solution for their problem is admission to Homes for the Aged. This is, at the present time, a very poor reward for a lifetime of work. Physically, these old people are cared for more or less adequately, but nothing else can be done with the present institutions. It is particularly hard on old couples, for few homes make provision for the reception of man and wife. Thus, after many years of married life, these old people are separated. One can only imagine their mental anguish. Few facilities are available for the useful employment of these people within their capabilities. Most of them merely vegetate until they die. There are a few hopeful signs of better days. Through the Federal government, generous subsidization of pensioners' housing is available to municipalities. By this means, low-cost housing can be provided for couples on pension and the family kept intact. The town of Burlington was a pioneer in this field and I would commend their efforts to your attention. This type of housing cares for the couples who are still physically and mentally able to look after themselves. We must also take into consideration the single aged person or the aged person too feeble to care for himself. To this end, the Provincial government, again by substantial subsidization, is encouraging the construction of new types of Homes for the Aged. Instead of the barracks type of building of the past, with complete segregation of the sexes, the new buildings will be of the cottage-colony plan and will allow couples to have a self-contained establishment as well as providing care for those unable to care for themselves.

There are special medical problems to be faced in this aging population. Chief among these problems are cancer and the degenerative diseases. Heart disease is now the greatest killer in Canada and the second place is occupied by cancer. When we group diseases of the blood vessels and of the kidneys with heart disease, over 36,000 people died in Canada in 1945 from these causes. In the same year over 14,000 people died from cancer. Contrast these figures with some other diseases we often consider of greater importance. In 1945, in Canada, 271 persons died from diphtheria, 79 from scarlet fever, 470 from whooping cough, and 5,546 from tuberculosis. Over a five-year period (1944-48) in Ontario there were only, on an average, about 20 deaths from poliomyelitis each year. What can be done about cancer and the degenerative diseases? The only way to meet the problem of cancer is through education. When a man or woman recognizes the symptoms of cancer in its early stages and takes the necessary steps to counteract them, the battle is half won. Research in prevention and treatment is making tremendous strides. Medical science does not have all the answers but already enough is known not only to prolong life but in many instances to effect a cure. In the problem of diseases of heart, blood vessels, and kidneys, again much is known of these diseases, much can be done to prolong life, but this requires the knowledge and co-operation of the patient. Complete cures may be infrequent, but partial cures, sufficient for happy, useful and often long life, are frequent.

One of our major problems today is the ever-increasing toll, both in lives and permanent crippling, being caused by accidents. This is true in all age groups but is most striking in childhood and adolescence. In the age group from one to

forty years the largest single cause of death is violent or accidental death. Much of this can be ascribed to the increasing mechanization of our lives, our hurry to get from one place to another, our carelessness of the rights of others. We can blame the car, the aircraft, the train, but many of the deaths are not due to these mechanical factors but rather to our own carelessness either in our homes or abroad. In the United States there is an average of 30,000 deaths each year from accidents in the home and it is estimated that 4,800,000 persons are injured each year by the same cause. The prevention of these deaths and non-fatal injuries is to be approached primarily through education. It is a prime example of a problem where the solution does not lie solely in the hands of the official health agency. Rather, to be successful it will require the participation of many agencies both official and non-official.

Chronic alcoholism qualifies as a public health problem on the ground of its social magnitude, its essentially medical nature, and the fact that promising practical scientific methods of attack are now available. It has been estimated that the number of alcoholics in the United States is about 750,000 (about 9 per 1,000) of the adult population, with a proportion of inebriates perhaps 5 times as great. We have all seen the results of certain approaches to the problem of alcoholism. Whatever our attitude may be to the use of alcohol, I don't think we can suggest that prohibition is the answer. On the other hand, government sale and regulation does not appear to solve the problem. Fundamentally, the chronic drinker is a medical problem. Too, we must outgrow the view that "the wages of sin is death". This is the chief reason why this particular group of sick people is either wholly ignored or treated with stupidity and barbarity. A program of education is needed not only for the problem drinker but also for the more fortunate members of the community who do not have to face the same difficulties. This has been recognized by more and more governmental authorities and a small beginning has been made in an attack on the problem.

In the beginning, we were faced with vast problems of physical illness. Now, as more and more of the physical illnesses are being brought under control, we are slowly beginning to realize the magnitude of our task ahead in dealing with the problem of mental illness. In 1946, in Canada, there were 49,163 mentally ill patients cared for in mental hospitals at an annual cost of nearly \$30,000,000.00. Even though these figures may astound us, they are only a small part of the total problem. These are clinically ill people, ill enough to be certified and committed to an institution. To these must be added vastly greater numbers who are not mentally ill but, certainly, not mentally well. One-third of all rejections of men examined for service in the past war was because of psychiatric disabilities and about one-third of medical discharges was for the same reason. Merely to provide hospitalization for the mentally ill is to close our eyes to the task. We must anticipate the psychiatric breakdown through a preventive approach. With regard to mental illness we stand where we stood twenty years ago with respect to many physical illnesses which have now been all but eliminated. There is a medical problem, but hand in hand with the physician there must be a movement of laymen, parents, teachers, the judiciary and citizens generally. The problem is as much sociological as medical.

Every health officer in Ontario today is constantly impressed by the terrible effect inadequate housing has had upon the mental and physical health of our people. Many of the most difficult questions we have to solve have their roots in poor housing. Juvenile delinquency, extra-marital pregnancies, behaviour problems, neglected children, inadequate nutrition, school difficulties, all of these and many others may have originated in poor housing. There are many factors involved, almost ten years when no houses were built, the greatly increased cost of building, the terrific sudden need for housing because of post-war marriages, and many others. Many cannot possibly afford to build and must take whatever accommodation is available. Others, because of urban employment, must stay in the large cities and worsen an already overcrowded area. Much has been done by various governmental authorities but much remains to be done. I offer no happy immediate solution. Rather, I would emphasize that poor housing is one of our major public health problems and we must not forget it.

Dental care has been available to the people of Ontario for a hundred years. In spite of that, the condition of dental health of our children and young adults is nothing short of ghastly. Anyone who has been associated with school medical services or with the armed forces will corroborate that statement. Dental authorities frankly admit they could not cope with the work that would be necessary to repair all the dental damage already present. What, then, is the solution? I do not have any but I do think that a new approach is indicated. Dentistry in the past has had a negative approach, it has repaired damage already done. The obvious thing to do is to make a positive approach on a preventive basis. This will require a tremendous amount of educational effort since the average parent still waits for an aching tooth, a huge cavity, or some similar episode before seeking the dentist. I suggest that the most valuable thing a parent can do is to get his child under early, adequate, continuous dental care from the age of 3 on. This may or may not rectify the situation but at least it is a sound approach.

Here, then, are some of the matters we must deal with now and in the immediate future: the care of the aged, both sociological and medical, accident prevention, chronic alcoholism, mental illness, housing, and dental disease. These would seem enough to keep us well occupied for many years to come. They are, however, only a few examples of needs in public health work today. Many other problems exist. It is obvious that there must be a shift in our emphasis away from the fields of acute communicable disease control and environmental sanitation to other areas where the control is as much sociological as medical.

The official health agency is merely the coordinating body in bringing the health to the desired high level. If we are to "enable every citizen to realize his birthright of health and longevity" the health officer must have the help and co-operation of citizens in every walk of life. Public health will only go as far as the people want it to go.

No single group has a larger part to play in this task than has the voluntary health organization. These voluntary associations are absolutely essential in a democracy. They draw public attention to disease and health and perform invaluable services in promoting public welfare. Governmental bodies, whether federal, provincial, or municipal, can only pass legislation when the majority of

the people want that legislation. There may be a need obvious to a few, but until that need is made apparent to most people, the legislative authority is helpless. That, to my mind, is the prime function of the voluntary agency, to educate the people to the specific need to the point where the governmental authority assumes the responsibility. Probably one of the most successful examples of this technique is the accomplishments of the Canadian Tuberculosis Association, with its local and provincial associations. This organization recognized the need long before governments were ready to act. Largely through its efforts, tuberculosis has been brought under control in most of the provinces and provincial governments have now assumed most of the financial burden of this disease. If it had not been for the leadership of this association, I doubt that we would be in the relatively good position we have reached today. The history of this association illustrates another important point in the role of the voluntary organization. Even though a voluntary agency may complete its original objective, it need not disappear, rather it shifts its efforts to other aspects. The Canadian Tuberculosis Association now functions in the preventive and educational field rather than in treatment. This aspect of its work is still needed, and by its efforts the Association fills an important place in the control of tuberculosis.

We, as health officers, would face a difficult if not impossible task if we were deprived of the help of the voluntary agency. Think of some of the voluntary agencies which have national coverage: the Health League of Canada, with its splendid program of health education; the Canadian Red Cross Society, with its many activities; the Victorian Order of Nurses, which provides beside care and health education in the home; the St. John Ambulance Association, with its first-aid services, the Canadian Cancer Society and the National Cancer Institute, with their efforts to control this dread disease; the National Committee for Mental Hygiene; the Canadian Arthritis and Rheumatism Society, a newcomer but tackling a most difficult problem. Another group must be mentioned, Alcoholics Anonymous, who go about their most valuable work quietly, but most effectively. We must not forget the service clubs. To mention only a few, think of the work done by the Lions' Clubs in sight preservation, and the work of the Rotary Clubs with crippled children. At the community level the health officer has the help of many local organizations. You, as representatives of your local groups, are visible evidence of the vast organization of both voluntary and official bodies, some as part of a national society, others purely local in character, but all working to the same end, the improvement of the public health. Without your help and co-operation the health department of the city of Toronto would face an almost impossible task in maintaining the excellent service now given to its people. In rural areas of Ontario we do not have this well-integrated, highly efficient organization of voluntary associations. This type of organization as typified by the Toronto Welfare Council is badly needed in rural areas to co-ordinate the efforts of many voluntary bodies; all doing excellent work, but needing direction of effort so that the maximum results may be attained. In our county, we have the help of many such associations; in fact, their representatives come to us asking what they may do. Eventually, we would hope to develop a similar body to your own. As one example of co-ordinated effort of lay and pro-

fessional organizations, I would cite our Child Health Centres. In our county we have an extensive service to infants and pre-school children through the Child Health Centres. In each instance these centres are sponsored by a local women's organization who not only provide the necessary lay help in the actual clinics but also, by their presence and their sponsorship, make these Child Health Centres true community enterprises—not just clinics for medical care.

Many of our problems in public health have been solved, but many are still before us. The official health agency is only one equal partner in this great enterprise. To succeed, the health officer and his staff must have full community help and co-operation. His most valuable ally is the organized voluntary group.

## The Development of Health Units in British Columbia

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UNDER THE British North America Act the authority in, and responsibility for, health matters is, with certain exceptions, delegated to the various Provincial Governments. Those exceptions include matters of a national nature, such as control of shipping and transportation facilities; port quarantine; leprosy control; Indian affairs; public health features of Federal projects, and so on.

In British Columbia the Provincial Legislature has in turn delegated much of its authority to local governments, be they city, municipal, or village. The Provincial Government is, of course, responsible for all health matters in the unorganized portions of the Province, and is also responsible for seeing that adequate steps are taken by local authorities to carry out essential health measures and to safeguard the health of their citizens.

Certain functions, too, which the Provincial Government is, for financial or other reasons, better able to fulfil, are provided on a Provincial scale. These include tuberculosis and venereal disease control programs; laboratory services; and public health engineering in the study and approval of plans for construction of water supply and sewage disposal works. The collection, recording, and interpretation of vital statistics is a Provincial function. Nutrition programs are sponsored by the Health Department, and consultant service in nursing, engineering, sanitation, education, and all other phases of public health, is provided. A rodent plague survey is carried on in co-operation with the Federal Department. Control of epidemics is in part a Provincial problem. Provincial regulations apply in the control of the shellfish industry; public eating and drinking places; industrial camps; tourist camps; summer camps; and water sheds. A reference library of books and films is being built up. School dental services is a prospect for the not distant future.

The British Columbia Health Act requires that the local government of each organized area act as a local board of health and appoint a medical health officer. The Act also provides for the appointment of the necessary staff of nurses, sanitary inspectors, and other personnel.

The Public Schools Act requires each school board to provide school health services, including yearly medical examination of students; school nursing service, and sanitary supervision of schools.

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*Presented at the Dominion meeting of the Canadian Institute of Sanitary Inspectors, held in the Chateau Laurier, Ottawa, October 17 and 18, 1949.*



In British Columbia we have large consolidated school districts. There is, as you will realize, an overlapping of three authorities in any one area since, with the exception of the large cities, each school district includes both organized and unorganized territory. Local governments function in the incorporated areas; the Provincial Government is responsible in the unorganized sections; and the school board has certain duties and responsibilities throughout the district.

Since, obviously, no single aspect of public health work can succeed by itself, the success of each authority's program and the effective exercise of its powers is dependent in part upon, and must fit in with what the others are doing. This situation must have been apparent to all concerned, and the introduction of the health unit system was no doubt the result of long study and planning to find a method that would most effectively and successfully co-ordinate the efforts and activities of the separate authorities, so that overlapping and duplication would be avoided and a balanced program result in each area and throughout the Province.

Today the health unit is the recognized method of extending over-all public health services to the people of our Province. Eventually a total of eighteen health units will cover the Province, with the exception of unpopulated areas and a few sparsely settled and inaccessible sections. Nine units are now in operation, and seven more of the proposed areas have full-time public health nursing and sanitary inspection services. At present these latter areas continue under the direction of local part-time medical health officers. These units and proposed units do not include the metropolitan areas of Victoria and Greater Vancouver.

In 1948 approximately 94 per cent of the population was receiving public health nursing services, and we had 105 nurses in the field. Our nurses have pioneered the health service in every section of the Province, and have laid the foundation upon which complete health service is being built. They have done and are doing an excellent job.

With the exception of the few older, and shall I say experimental units, this development has been recent and rapid. In studying the records and history of the British Columbia Health Department, however, it has become apparent that the recent establishment of health units is the culmination of many years of planning and growth. A glance into that history is therefore of interest and will give you a picture of the background.

In 1869, two years before British Columbia became a Province of the Dominion of Canada, the Health Department had its humble beginning in a Public Health Ordinance, which provided for health districts, local boards of health, sanitary regulations, and the appointment of a Provincial health officer when need might arise. In 1892, following the outbreak of a smallpox epidemic, Dr. Davie was appointed to enforce the sanitary regulations drawn up to meet the emergency.

In 1893 the first 'Health Act' was passed, providing for a board of health, which was instructed "to concern itself with all things affecting or likely to affect the public health". The first sanitary inspector was a Mr. Clive Phillips-Wooley, appointed in 1896 to enforce regulations for the control of a typhoid epidemic which broke out in the Kootenay area of south-eastern British Columbia.



The first board of health was composed of five or six doctors appointed by the Government. It was not until an amendment of the Act in 1899 that the Lieutenant-Governor-in-Council became the board of health for the Province. From that time on, too, the municipal councils were required to act as local boards. From 1901 on, successive amendments to the Health Act have provided wider powers. Dr. C. J. Fagan became secretary of the board, an office he held until 1914. Largely due to his efforts, the Tuberculosis Sanatorium at Tranquille was built.

In 1913 a Provincial Laboratory was started in Victoria, but its operation was suspended during the first world war. From 1920 on, laboratory services were provided by contracts with various hospitals and it was not until 1931 that a Provincial Laboratory was established in Vancouver. This was expanded in 1937 to form the Division of Laboratories, with several branches, and under one director.

The first Venereal Disease Control Act was passed in 1919. The Tuberculosis Division came into being in 1923. Nineteen hundred and thirty-six saw the formation of a division of Venereal Disease Control, and in 1937 the Division of Vital Statistics was set up. A Provincial Epidemiologist was appointed in 1929. In co-operation with the Dominion Government, the Rocky Mountain spotted fever and sylvatic plague survey was commenced in 1938.

Organization of the Provincial Public Health Nursing Service took place in 1929, for the purpose of providing follow-up service to the school medical examinations which had commenced as long ago as 1910. Actually the first public health nurse was appointed in 1917, in the Saanich District of Vancouver Island. From 1921 on, the University of British Columbia has provided a course in public health nursing, and enjoys the distinction of being the first university in the British Empire to offer a course in nursing leading to a degree.

Dr. Henry Esson Young, who held the office of Provincial Secretary and Minister of Education from 1907 until 1915, became Secretary of the Board of Health in 1916, and served in that capacity and as Provincial Health Officer until his death. He was succeeded in 1936 by Dr. G. F. Amyot, who later became our first Deputy Minister of Health.

The British Columbia Health Department has had a varied history. Previously the Provincial Board of Health, it was first under the Attorney General's Department. In 1906 it was transferred to the Department of Agriculture, and in 1907 to the Provincial Secretary's Department, where it remained until 1946. In that year a separate Department of Health and Welfare was formed, under its own minister. There is a Health Branch and a Welfare Branch, each having its own Deputy Minister.

While these progressive changes and developments were taking place, the health unit system had its beginning. I do not know where the health unit idea first started, but I understand that the first on the North American Continent were one in eastern United States and one in the Yakima district of the State of Washington, in 1911. British Columbia formed her first health unit in Saanich in 1921, thereby leading Canada in this type of development. The second unit came into being in the Okanagan Valley in 1929 as a result of the expansion of

public health services commenced in Kelowna city in 1922 and which later, in 1928, took in Kelowna District. North Vancouver became the third health unit, in 1930, and Peace River Health Unit, in the far north-east of the Province, opened in 1935. It may be of interest that Dr. Amyot was Director of the North Vancouver Unit prior to becoming Provincial Health Officer, while Dr. J. S. Cull, now Assistant Director of the Red Cross Blood Transfusion Service for Canada, was the first director in the Peace River Unit, and later became Assistant Provincial Health Officer. Dr. Cull was succeeded in Peace River by Dr. J. M. Hershey, later Director of British Columbia Hospital Insurance, and Dr. J. A. Taylor, who is our present Deputy Provincial Health Officer and Director of Local Health Services.

The financing and organization of these early health units varied considerably from the present method, which I will discuss in more detail later. The first unit, in Saanich, was started under the sponsorship of the Women's Institutes, and was at first financed by voluntary funds. This method proved unsatisfactory since the variation in moneys available from year to year made planned progress and expansion difficult. Subsequently it was financed by a Government grant plus local taxes. This pattern was followed in later units, where control rested with a local union board representing the various municipal councils and school boards within the unit territory. These boards set up their own budget and conducted the business of the units. Staff members were employed by and paid by the boards. The Provincial Department had no direct control of the local unit administration, beyond serving in an advisory capacity.

The Peace River Health Unit was one exception, in that for many years it was financed and administered entirely by the Provincial Department. The Peace River section of British Columbia was, at the time the unit was formed, an isolated, sparsely populated portion of the Province, still in the pioneer stage, and very hard hit by the depression. Poverty plus lack of local medical and hospital facilities made some health service essential, and this was provided through the Health Unit. Most of the area was unorganized, and even today there are only three incorporated villages within the Peace River district. It was not until a few years ago that this area made some local contribution toward health service costs.

Organization and operation of the first few health units in British Columbia was assisted financially during the early years by grants from the International Health Division of the Rockefeller Foundation. Subsequent accomplishments have more than justified this help.

Meanwhile Vancouver and Victoria, the only large cities in British Columbia, developed their own health departments with staffs including medical health officers, public health nurses, sanitary inspectors, etc. In 1936 there was set up in the Greater Vancouver Area what has been described as an experiment unique on the North American continent. A Metropolitan Health Area was formed, combining six city and municipal health departments, five school boards, and the University medical services, under the direction of a senior medical health officer. I mention this merely to round out the picture and because I shall refer later to a more recent development in Vancouver City.

You may have been struck by the lack of reference to sanitary inspectors so far. Vancouver has of necessity employed a staff of inspectors for many years past. The inspection service was divided into three divisions, food control, quarantine, and sanitation.

I should like at this point to pay tribute to the earlier members of the Vancouver inspection staff, who were among the pioneers and founders of the Canadian Institute of Sanitary Inspectors. We owe a debt to them and to their contemporaries across Canada, for their persistence and courage, which should be an inspiration to us younger men upon whom the future of this Institute depends. Victoria City, too, has had a small staff of sanitary inspectors for many years.

In the Provincial field, the first major sanitation problem was the fish canneries, of which there were dozens along the coast. In 1903 Capt. F. S. DeGrey, master mariner and St. John's First Aid Man, was appointed cannery inspector. In 1912 Capt. DeGrey became assistant sanitary inspector, and in 1917 was made chief sanitary inspector, a position which he held until 1940. In 1917, too, the Department bought a 65-foot power boat, the *Sanita*, which was used for inspection trips up and down the coast, and which remained in service until the late 1930's.

The Saanich Health Unit and the Okanagan Health Unit each employed a sanitary inspector on their staff, but the Peace River Unit had none until conditions arising out of the construction of the Alaska Highway resulted in my appointment to that unit in the fall of 1942. Mr. Claude Stonehouse, now our chief inspector, preceded me in the service by a few months, his first appointment being to the Prince Rupert Health Unit, which came into being in 1942 as a result of wartime boom conditions, and was the fifth unit to be established in the Province. With the expansion of the Okanagan Health Unit to include the Penticton area, a second sanitary inspector had been appointed to that unit in 1941, and prior to that, in 1940, a public health engineer, in the person of Mr. Reg. Bowering, was employed by the Department. Mr. Bowering is now director of the Division of Environmental Sanitation.

It is only recently that a qualified sanitary inspector has been appointed to the North Vancouver area. For many years that health unit made use of an untrained man who was plumbing inspector and general handyman. A similar situation has arisen in past years in a number of other centres where municipal authorities have named as sanitary inspector some unqualified person who might more aptly be described as a nuisance officer and who usually combined the duties of licence collector, dog-catcher, and man-of-all-work. This situation caused us a great deal of grief and trouble during past years, particularly since these appointments were contrary to that provision of the British Columbia Health Act which specifies that no person may be appointed a sanitary inspector in British Columbia unless he holds the C.S.I.(C.) or a satisfactory equivalent. However, I am happy to be able to say that as health units are being formed and full-time sanitary inspectors appointed throughout the Province, this problem is rapidly disappearing.

The development I have outlined so far provided the various essential

specialized health services. The next step was to establish throughout the Province a form of local public health service that would adequately take care of local problems and would at the same time serve as field staff for the specialized divisions. The health unit system had by 1940 been given a thorough trial in the four experimental units previously opened. This trial period allowed time to find and correct the mistakes that were made at the start. It also enabled the Department to train a number of directors and other staff personnel in health unit administration and policy.

I want to emphasize that although the British Columbia Department of Health is convinced that health units are the best method of providing local health services, it is not the policy of the Department to force the establishment of health units. The local autonomy of school boards and municipal councils is respected. They are offered Provincial co-operation in the form of a health unit, but in no district is a health unit actually set up until all local governing bodies have stated their approval and have made an application to the Department of Health to have a unit established.

The success of the older health units became known throughout the Province, and in recent years many other districts have requested the same service. In fact, due to wartime and post-war shortage of personnel, particularly qualified public health doctors, formation of units has been delayed in a number of districts. Today three of the existing units have no full-time director, and arrangements are completed for five more areas which are only awaiting the availability of qualified full-time medical directors to become full-fledged health units.

Since 1942 the development has been fairly rapid. Central Vancouver Island Unit and North Okanagan Unit were opened in 1944, East Kootenay in 1947, Cariboo Unit of 1948, and Upper Fraser Valley in the summer of 1949.

It has until recently been the policy of the Department not to encourage expansion of local services beyond that of public health nursing service until full-time directors are available. Recently, however, the delay due to prolonged lack of doctors, plus the growing demand for sanitary inspection, has resulted in the appointment of sanitary inspectors to nearly every section of the Province, and additional inspectors to some of the larger existing units. This was made possible by the Federal Health Grants, and toward the end of 1948 ten additional sanitary inspectors were employed, bringing our field staff up to 22. Two more were added this year. Early in 1949 Mr. Norman Goode was engaged as Assistant Public Health Engineer. Several more sanitary inspectors are needed to cover the Province adequately, and it is probable that the chief inspector will need some assistance in head office. Later there may be openings for field supervisors.

I must admit that I know very little about the organization of health units in the other Provinces, and I shall not attempt comparisons. I understand that in Ontario the health units are self-contained and governed by local boards. The staff are, I believe, employees of the district and not of the Provincial Health Department.

I have already told you that we in British Columbia organized our earlier health units on that basis too. In 1946, however, a complete change was made. Certain disadvantages in the existing method became apparent. It was difficult

to establish any uniformity in salaries across the Province. There was no provision for regular increases in pay, nor for superannuation. Policy regarding sick leave and holidays tended to vary from district to district. Individual units did not have the resources to sponsor further training for public health personnel. It was difficult to arrange transfers for those who wished to change their location.

May I repeat that under the original arrangement the Government made a grant to each local union board of health, and that the necessary balance was collected locally through taxes. The local board made up its own budget, administered the unit, and was in full control. Since 1946 the arrangement has been completely reversed. By agreement with school boards, thirty cents per caput is collected by taxation and paid to the Provincial Department as a local contribution toward the cost of health services. The balance of the cost of health unit operation is paid from the general revenues of the Province and is provided for in the Health Department's annual budget.

This arrangement is a departure from what is regarded as orthodox practice. I believe British Columbia has gone farther than any other place in North America in applying this system of health unit financing. I understand it is regarded by many public health authorities as a doubtful experiment and contrary to the Canadian tradition of local autonomy.

This new method is, however, entering its fourth year of trial and is proving satisfactory. We had concrete evidence of that recently when a city contemplating forming a health unit wrote to the councils of several other small cities which are already in health units, and asked them three questions: (1) "Are you satisfied with your health services?" (2) "Is the present system more satisfactory than the previous one?" In each case the answer to these enquiries was "Yes". The third question was "Would you change back to local administration of health services?" The answer was "No".

There are certainly some very definite advantages both to the Provincial Department and to the health unit employees. All health unit staff are now Provincial Government employees. The department can move or transfer individuals when it is desirable to do so. Thus persons with specific ability or experience can be sent where they will be most useful. The senior and more experienced members of the staff can be used in areas where things are difficult or special problems arise, and to set up new health units. In case of epidemics or disaster such as the 1947 floods in the Fraser Valley, staff members can be temporarily withdrawn from other areas and sent immediately to deal with the emergency.

The Department is endeavouring to foster an appreciation of the group nature of public health problems; to develop co-ordinated action and a knowledge of the over-all picture. Each member of the staff learns to think in terms of Provincial service instead of being concerned only with the local problems of one area.

Through our annual Provincial Public Health Workers' Institute, which is in reality a Health Department staff meeting, we all get together once a year to review the past year's work and to receive instructions for the coming year. Educational features are provided. We discuss our problems and help each other. The result is a uniformity of policy, approach, and methods throughout the



Province, which was perhaps less evident and harder to attain under the older system with locally controlled units.

Another advantage is in the recruitment of personnel. It is easier to hire suitable trained persons when the position offers opportunities for promotion, transfer and specialization; when it provides uniform salary schedules and regular increment, paid holidays and sick-leave privileges, and a superannuation scheme.

These, too, are the advantages to the staff members which make the positions more acceptable. Under our system we can change location without loss of seniority or drop in salary. There are opportunities for in-service training, and to transfer to one or other of the divisions for specialized work and experience. Under the previous set-up these things could only be done by arrangement with the several authorities involved, by leave-of-absence, or by resigning and seeking employment elsewhere. This often meant loss of seniority and perhaps a lower salary.

There are advantages to the local areas, too. Members of local councils and school boards are seldom paid, or at least receive only a nominal allowance. Each additional responsibility is an added burden requiring more voluntary time and effort. The quality of administration tends to vary from year to year and from place to place. The present plan relieves local councils of direct administrative responsibility for health services, yet they retain a measure of control through representation on an advisory union board which meets quarterly to review the work of the health unit and to convey to the director and his staff their opinions and desires as to policy to be followed and the work they want done in their communities.

Each locality and community enjoys, too, a direct connection, through the unit staff, with the Province's special services and divisions. Consultative services are available automatically. Staff members are kept up-to-date by regular staff meetings and by occasional refresher courses, and in-service training. When a local epidemic or emergency arises, additional trained personnel are available promptly without extra cost to the local government.

There are, of course, some problems involved and some disadvantages or potential disadvantages. There is the possibility that local interest will decrease because of lack of direct local responsibility for the day-to-day work of the health services. A feeling may arise that since the local board is advisory and not administrative, its services are of secondary importance. These boards may thus lose interest, attendance may drop off, and they may cease to function effectively, thereby tending to sever the connection between local authorities and the health services which they are still legally responsible for providing.

It becomes necessary for the director and his staff to foster and encourage local interest and to make a point of submitting regular reports and to seek advice and comments.

Another danger is that occasions may arise when the Health Department might change a unit staff or move members in and out of an area too frequently, thereby impairing the efficiency of service in that locality. We all realize that a



knowledge of one's district and acquaintanceship with its people is necessary to effective work.

Perhaps the best safeguard against these inherent weaknesses in our present plan is that we are aware of them and are consciously trying to offset any such undesirable trend.

In summary, I would say that the health unit type of local health service organization has proved itself and is firmly established in British Columbia. It began there as an experiment, developed in traditional pattern, and recently adopted a clear-cut departure from the recognized form of organization. Perhaps it is too early yet to pass judgment upon what some public health authorities elsewhere in Canada seem to regard as an experiment, but we in B.C. are gratified with the results so far, and we anticipate continued success for this new method of financing and administration. Perhaps we may be pardoned if we say with pride that in this, as in some other things, we have led the way in Canada. We have pioneered successfully.

I referred to the fact that in the Vancouver Health Department the inspection services were divided. Furthermore, there was little day-to-day contact or co-operation between the sanitarians and the public health nurses—so little, in fact, that their relationship approached a state of suspicion and rivalry.

In so far as the sanitarians are concerned, division means specialization. Work in one department is less interesting than that in another. Inspectors do not get over-all experience. It also means that several inspectors from different departments may call on one party or firm in a short period of time, which the public tends to dislike. Inspectors do not develop the same sense of personal responsibility for a district.

The metropolitan area has always been divided into units or districts for public health medical and nursing services. Dr. Stewart Murray, Senior Medical Health Officer, is now in the process of extending the unit type of organization to the field of sanitary inspection. There will be a chief or senior sanitarian in each unit, and the inspectors will each have a district and will do generalized inspection, being responsible for all phases of sanitation within their own territory. I believe the change is welcomed by the sanitary inspectors and will be to their advantage. Whether the new arrangement will prove successful remains to be seen.

Since this gathering is a sanitary inspectors' meeting, you will, I know, be keenly interested in the standing of the sanitarian in the B.C. public health service. Our present position, both in numbers and recognition, is most gratifying. Prior to 1940 there were only two sanitary inspectors employed in B.C. outside of Victoria and Vancouver. This number increased to nine by 1948. In the past year it has increased to 23, and a few more appointments are expected in the near future.

I think we can say truthfully that sanitary inspectors were not very highly rated by the Health Department eight or ten years ago. One can note that a pamphlet published in 1943 on Administration of Provincial Health Services did not once mention sanitary inspectors. They were regarded as, I shall say, the

Joe-boys who are called upon to do the alley patrols and routine work. Circumstances have altered that viewpoint to our advantage. Sanitary inspectors have been left in health units without supervision for periods of two or three years when directors were not available. They have been sent to areas without health units, to initiate a sanitation program where there had previously been no sanitary inspection. I can tell you with pride that we have measured up. We have undertaken responsibilities and have accomplished things far beyond that expected of us, and today we are established and respected members of the public health service.

There is another feature of public health work in B.C. which is worthy of mention. That is the feeling of partnership, of being a team, that exists between the various professional and technical groups. We work together, help each other, share our problems. Sanitary inspectors assist in V.D. follow-ups and case-finding. Nurses help with school and home sanitation programs and collect water samples. Directors, although they are the administrative heads of the units, do not deny us the opportunities to publicly represent our units. Nurses and sanitary inspectors speak to councils, service clubs, parent-teacher organizations, etc., and over the air. I believe there is an esprit de corps in the Provincial health service today which is an asset to the Department and to the people of the Province, and a source of satisfaction to us all.

# Canadian Journal of Public Health

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## INTERNATIONAL CERTIFICATES OF VACCINATION

THE International Sanitary Conventions of 1944 made provision for international certificates of vaccination against four diseases of international concern: smallpox, cholera, typhus, and yellow fever. Different countries have established different requirements, and in this day of world-wide air travel, much confusion arises, with consequent inconvenience to travellers. The World Health Organization's Expert Committee on International Epidemiology and Quarantine has made recommendations which would clarify and simplify the issuing of these certificates. The recommendations are being included in the new International Sanitary Regulations which are to replace the existing Sanitary Conventions and will be submitted to the Fourth World Health Assembly for approval in 1951. A highly important contribution is therefore being made by the World Health Organization.

The subject is being brought to the attention of medical officers of health because the international certificates of vaccination are not widely known and the assistance which the health officer may give is not understood. The Department of National Health and Welfare has made available, in booklet form, the international certificates for vaccination against smallpox, yellow fever, typhus fever, and cholera. Three pages are provided for recording other vaccinations, such as typhoid-paratyphoid. The booklets may be obtained by physicians on request to the Quarantine Division, Department of National Health and Welfare, Ottawa.

The use of the international certificate form is not obligatory except for recording vaccination against yellow fever. Yellow fever vaccine for use in Canada is supplied by the Department of National Health and Welfare, and vaccination can be performed only in centres established across Canada by the Department. The vaccine consists of an attenuated strain of living virus which must be preserved under very strict conditions. The official certificate form is supplied for each vaccination, and a departmental stamp is placed on it. The stamp of the Department on the certificate is a guarantee that the vaccine has been properly prepared and stored until the time of administration. A list of the centres in which inoculations may be performed can be obtained from the Quarantine Division of the Department.

For vaccinations against smallpox, cholera, and typhus fever, a certificate given by the practitioner performing the vaccination may replace the international certificate form furnished by the Department of National Health and Welfare. The certificate must state the origin and batch number of the vaccine used, with the dates of the inoculations, and must bear the signature of the physician for each inoculation. Thus a certificate would record three inoculations of typhus-fever vaccine and the required number of doses of cholera vaccine. A certificate of vaccination against smallpox must indicate whether a typical primary vaccination or the reactions of re-vaccination were observed. In re-vaccination, the words "early reaction" and "accelerated reaction" should be used in describing the reactions.

In practice, the physician's certificates will be of greater value to the traveller if countersigned by the medical officer of health of the municipality in which the person received the vaccination, or by the provincial health officer. In a letter published in a recent issue of *The Lancet*, Sir Philip Manson-Bahr, M.D., points out that "many governments require inoculation and vaccination certificates to be authenticated and stamped by a government medical officer or medical officer of health. . . . As it is not always certain at any time which governments do insist upon this authentication, it is in the passenger's interests for all certificates to be officially stamped." The certificate of the physician should be verified by the medical officer of health only when complete information, as required by the international certificate, is given. The use of the booklet of certificates issued by the Department of National Health and Welfare is, therefore, of great assistance. It details the exact information required and provides space for a signature for each inoculation. In the space marked "official seal" the certifying health officer's signature can be placed. The signature is, of course, not taken as a guarantee of the effectiveness of the procedure but as confirmation of the fact that the person who performed the vaccination or inoculation was properly qualified.

#### ONTARIO'S NEW MINISTER OF HEALTH

**I**T is gratifying to public health workers in Canada that the new Minister of Health for Ontario is a physician who has given excellent service as a medical officer of health. In announcing the appointment of MacKinnon Phillips, M.D., C.M., Premier Frost emphasized Dr. Phillips' interest in public health as evidenced by his serving as medical health officer of Owen Sound for many years. Dr. Phillips also brings to his important office a thorough knowledge of medicine, gained from his years of general practice. He has given ample evidence of his keen interest in the common objective of both the private practitioner and the health department, the advancement of the health of the community.

Dr. Phillips, who was born in Shrigley, Ontario, is a graduate in medicine of the University of Toronto and did post-graduate work in the Harper Hospital, Detroit. He served with the 45th Field Royal Canadian Artillery from 1916 to 1918. Dr. Phillips was first elected to the Ontario Legislature in June, 1945, representing the constituency of Grey North. He was re-elected in 1948, and appointed Minister of Health last month.

## NEWS

### British Columbia

DR. G. F. AMYOT, Deputy Minister of Health, has been honored by the American Board of Preventive Medicine and Public Health, which recently awarded him the Specialist's Certificate in Preventive Medicine and Public Health.

INCLUDED among the members of the staff of the Department who have left for post-graduate training in public health are:

Dr. W. G. Hall, dentist with the Division of Preventive Dentistry, who has gone to the University of Michigan to study towards his Diploma in Dental Health.

Dr. T. H. Patterson, formerly Director of the Cariboo Health Unit, who is taking his M.P.H. in industrial hygiene at the University of Michigan. Michigan will also be alma mater for Mr. Archie MacKenzie, who will work towards his M.P.H. in health education.

Mr. Bill Nichol, a senior clerk with the Department, is taking the two-year course in Hospital Administration. Mr. Nichol will attend the University of Toronto for a year and will go on to take his internship at the Vancouver General Hospital. At the completion of this training he will receive his D.H.A.

Dr. W. G. Watts, Director of the East Kootenay Health Unit, turned his job over to Dr. E. N. McKay when he left to attend the University of Toronto this fall. Dr. Watts will work towards receiving the D.P.H.

DR. MARTHA E. MARRITT, a recent graduate in Medicine of the University of Toronto, has been appointed director of the Peace River Health Unit.

DR. P. O'D. GALLAGHER, Chief Medical Officer with the Department of Health in Newfoundland, visited the Victoria Division of the Department of Health during August. He met with the directors of the Division and was acquainted with the organization and administration of public health in this province.

### Saskatchewan

STEPS HAVE BEEN taken toward revision of the five-year course of the University of Saskatchewan's School of Nursing to permit specialization in the fifth year of study. The present course, leading to the bachelor of science in nursing degree, does not provide training in public health nursing, teach-

ing and supervision, or administration. So far, graduates wishing to specialize have had to go outside the province and devote another year to study. The proposed changes have been recommended by a special committee and a federal grant-in-aid has been approved for fifth-year instruction in public health nursing.

A START IS BEING MADE this autumn on the construction of the new Saskatchewan Training School for the mentally retarded. Replacing the temporary buildings at the Weyburn airport, the new school on the outskirts of Moose Jaw will ultimately have 1,100 beds.

MR. JAMES GIBBARD, chief, and Miss Elizabeth Campbell, of the Laboratory of Hygiene, Department of National Health and Welfare, have made an extensive survey of laboratory facilities in Saskatchewan and their report to the Department of Public Health is expected soon.

SEVEN NURSES on the staff of the Department of Public Health have completed post-graduate studies during 1949-50 and have returned to the province. Miss M. L. McColl and Miss E. Moore, who took the advanced course in administration in public health nursing at the University of Toronto, have been assigned as senior nurses to the North Battleford and Swift Current health regions, respectively. Miss L. F. Sawyer and Miss F. Kelm, with certificates in public health nursing from Toronto University, are at Lloydminster in the North Battleford health region and in the district of Yorkton. Miss E. Randall returned from the University of British Columbia to the staff of the Swift Current Health Region, while Miss N. Warren is back from the University of Manitoba and will work in the North Battleford region. Miss G. N. Aylsworth completed the course in nurse-midwifery at Maternity Centre in New York. She succeeds Miss M. Lyons at Buffalo Narrows Nursing Home. Miss Lyons has registered with the 1950-51 class in hospital administration at the University of Toronto.

MR. CHRISTIAN SMITH, formerly director of health education in the Saskatchewan Department of Public Health, has returned to that position after fourteen months with the Canadian Mental Health Association, Toronto, as director of public information.

MR. J. D. WARD, assistant director of health education, attended in July the Ameri-

can National Training Laboratory in Group Development at Bethel, Maine. The laboratory is conducted each summer as an intensive training experience in human relations. Drawn from public health, education, and industrial administration, 110 delegates came this year from four countries.

MISS BARBARA MCPHERSON has been appointed as nutrition consultant to child welfare institutions in Saskatchewan. Her work will be directly concerned with the food service in these institutions. She will assist with menu planning, food ordering and kitchen arrangement in the various homes established for the wards of the Department of Social Welfare. She will also do educational work with foster parents, and, in the future, arrange in-service training for the food personnel in the institutions.

MR. ALLAN McTAGGART has been appointed hospital consultant in the Division of Hospital Administration, Department of Public Health. The position was created to give hospitals throughout Saskatchewan consultative service regarding administration problems.

#### Manitoba

DR. G. B. LEYTON has been appointed Director of Laboratory Services for the Department of Health and Public Welfare. A graduate of Cambridge University, he has served on the staff of several English hospitals and was with the R.A.M.C. for five years during the recent war. After his discharge, he received his Diploma of Clinical Pathology from London University.

A CHEQUE FOR \$17,000 was presented to Mr. Justice A. M. Campbell, President of the Society for Crippled Children of Manitoba. This money was raised by Kinsmen in Manitoba from Easter Seal sales and the presentation was made during the National Convention of the Association of Kinsmen.

SOME FAMILIES in St. Laurent, Manitoba, who have been living mainly on bannock, potatoes and lard, were taught proper cooking of essential foods by the Provincial Nutritionist during special July classes. The course was requested by the women and the classes were conducted in the com-

munity hall kitchen. Marketing and cooking instruction were given on the following food groups: milk, cereals, fruits, vegetables, meats and meat substitutes. Since all these families receive family allowance cheques, the nutritionist gave some instruction on the proportion of the cheque to be used to buy food and she also dealt with child feeding, a proper breakfast, lunch and dinner.

This was the third course of its kind this year and each time the women have asked the nutritionist to return for a longer course.

FIVE PUBLIC HEALTH NURSES attended the University of Minnesota for the summer course of post-graduate study on nursing education and supervision in public health nursing. They were: Miss A. LaPorte, of the St. Boniface Health Unit; Miss A. Kennedy, of the St. James Health Unit; Miss P. Hadland, of the Swan Valley Health Unit; Miss M. McLeod, of the Selkirk Health Unit; and Miss F. Thomson of the Portage la Prairie Health Unit.

MISS MARY WILSON, senior nurse in the Selkirk Health Unit, and Miss Jessie Williamson, senior nurse of the Red River Health Unit, are attending Columbia University for a year of post-graduate study in public health nursing supervision and nursing education.

MISS VERA PEACOCK, instructress in practical nursing, is taking post-graduate study this year in nursing education and teaching at the University of Manitoba.

SEVEN NURSES are taking post-graduate courses in public health nursing at the University of Manitoba. They are: Miss M. Cymbalist, of the Dauphin Health Unit; Miss E. Pattinson, of the Selkirk Health Unit; Miss V. Little, of the Virden Health Unit; Miss A. Stadyk, nurse in the town of Transcona; Miss Alice Merlevede, of the St. Boniface School of Nursing; Miss Muriel L. Small, of the City of Winnipeg Health Department; and Miss Mary Creber, on the staff of the Municipal Hospitals.

THE FOLLOWING NURSES have been appointed to the staff of Public Health Nursing: Miss Jean Adams, Miss G. A. Lawson, Miss P. M. Beecher, Miss H. L. Morden, Miss E. Rowan, and Mrs. Ruth M. Turner, who has been named assistant instructor of practical nurses.



